CAT

Critical thinking Assessment Test

INSTITUTIONAL REPORT

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The CAT Instrument

The CAT instrument is a unique tool designed to assess and promote the improvement of critical thinking and real-world problem solving skills. The instrument is the product of extensive development, testing, and refinement with a broad range of institutions, faculty, and students across the country. The National Science Foundation has provided support for many of these activities.

The CAT instrument is designed to assess a broad range of skills that faculty across the country feel are important components of critical thinking and real world problem solving. The test was designed to be interesting and engaging for students. All of the questions are derived from real world situations. Most of the questions require short answer essay responses and a detailed scoring guide helps ensure good scoring reliability.

The CAT instrument is scored by the institution's own faculty using the detailed scoring guide. Training is provided to prepare institutions for this activity. During the scoring process faculty are able to see their students' weaknesses and understand areas that need improvement. Faculty are encouraged to use the CAT instrument as a model for developing authentic assessments and learning activities in their own discipline that improve students' critical thinking and real-world problem solving skills. These features help close the loop in assessment and quality improvement.

Effectively Using the CAT Instrument

Assessment Models/Designs

The CAT instrument is adaptable to a variety of assessment goals and designs. We discuss these assessment goals and some of the more frequently used models below.

The CAT instrument can be used for a variety of assessment goals.

- Evaluate effects of college education
- Evaluate effects of a program of study
- Evaluate effects of a course
- Evaluate effects of informal learning experiences

There are a variety of assessment designs that can be employed with the CAT instrument. The CAT instrument is very adaptable to various research/assessment designs because the test is very sensitive to treatment effects and because the test can be used with all levels of college students without floor effects (students obtaining the minimum score possible) or ceiling effects (students obtaining the maximum score possible). These include:

- Pre-test/Post-test designs
    - Test students at the beginning and end of course or experience (with or without a control group).
    - Test students when they are freshmen and then again when they are seniors (true value added).
- Cross-sectional studies
    - Compare freshmen to seniors (typical value-added analysis).
- Evaluate changes in program outcomes over time
    - Compare scores on the CAT after program improvements to established baseline scores that precede program changes.
    - Compare scores on the CAT to national norms over time and look for improvements.

- Evaluate changes in programs or courses by comparison to a control group.
    - Compare scores on the CAT for students who have had special courses/experiences to those for a control group who have not had the special courses/experiences.

Reducing Costs with Appropriate Sampling

We advocate a variety of practices to reduce the cost of testing without compromising the accuracy of the assessment. For example, various sampling strategies can be used to reduce the need to test all students. If that is not possible, then only a sample of the tests given might be scored. We discuss two accepted methods of sampling to ensure valid and representative results. However, we realize that the sampling techniques are not feasible at all institutions. Center staff will be happy to discuss these and other alternatives in more detail.

1. Random sampling: A subset of the student population of interest is randomly selected for testing/scoring.   The larger the sample, the more confidence there is that the sample is representative of the population of interest. In a random sample, all students have an equal chance of being selected. This is not to be confused with a convenience sample that includes only those students who volunteer to take the test.

2. Stratified random sampling: The population is divided into subgroups (e.g., Arts & Sciences, Engineering, Education, etc.). A random sample of students within each subgroup is then selected. The number of students in each randomly sampled subgroup should be proportional to that group's proportion of the population. Stratification can help ensure a more representative sample with smaller sample sizes.

Sampling after Test Administration

In many institutions it is not possible to administer the test to a random sample of students within a class. In these situations, we recommend administering the test to the larger group and then randomly sampling tests from that group to score during the faculty scoring session. This procedure will allow institutions to achieve a more representative sample without greatly increasing the faculty time needed to score tests. We recommend having a minimum of 10 – 15 tests or pairs of tests per group (e.g., class, program of study, etc.).

Scoring Accuracy Checks

At various times during the year, we conduct analyses of scoring accuracy and provide feedback about the accuracy of scoring and, if necessary, specific recommendations for improving the accuracy of scoring on a question-by-question basis. These reports are sent separately from the institutional summary report.

# Example Assessment Designs to Use with the CAT Instrument

(These designs can easily be coded in the Local Code Field on the CAT Instrument)

Objective	Model/Design	Sampling Procedure	Sampling Before Scoring	Advantages/ Disadvantages
Find Courses or Programs of Study that Improve Students' Critical Thinking	**Pre-test vs. Post-test** In selected courses or programs of study (matched students)	Administer to all students at the beginning and end of certain targeted courses or experiences	Randomly sample pairs of tests to score from each course or experience. (minimum of 10 matched pairs of tests per class)	A powerful and efficient design to evaluate specific courses and experiences (student IDs must match).
	(students not matched)		(min. of 15 pretests and 15 post-tests per class)	Less efficient & less powerful than above
	Pre-test vs. Post-test With Control Group In selected courses or programs of study (matched students)	Administer to all students at the beginning and end of certain targeted courses or experiences	Randomly sample pairs of tests to score from each course or experience. (minimum of 10 matched pairs of tests per class)	A powerful design to evaluate treatment effects relative to a control.
	(students not matched)		(min. of 15 pretests and 15 post-tests per class)	Less efficient & less powerful than above
	Treatment vs. Control	Administer to all students at the end of certain targeted courses or experiences	Randomly sample tests that will be scored after administering to a larger sample	Might be difficult to establish equivalence of treatment & control conditions.
How much is the institution or program of study improving students' critical thinking	**Freshmen vs. Upperclassmen** (value added) **Cross-sectional study** (must equate groups)	Administer to a random sample of freshmen and seniors every year	Randomly sample tests that will be scored after administering to a larger sample	Might be difficult to establish equivalence of Freshmen and Upperclassmen if there is attrition.
Is the Institution making progress in improving students' critical thinking	**Cross Sectional Study** of Seniors over time (with or without National Norm Comparison)	Administer to a random sample of seniors (or all seniors) every year	Randomly sample tests that will be scored after administering to a larger sample	Would be necessary to establish the equivalence of samples over time.

Using the Local Code Fields to Identify Assessment Design

A local code field with 4 digits appears on the back of each test booklet. You should use this area to code subgroups in your population so that the data can be easily analyzed.

Recommended Use of Local Code

Local Code

1   2
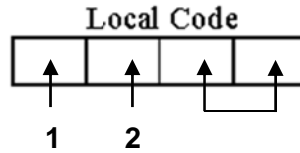
Column 1: Use to indicate the **Type of Design** for data included in the report.
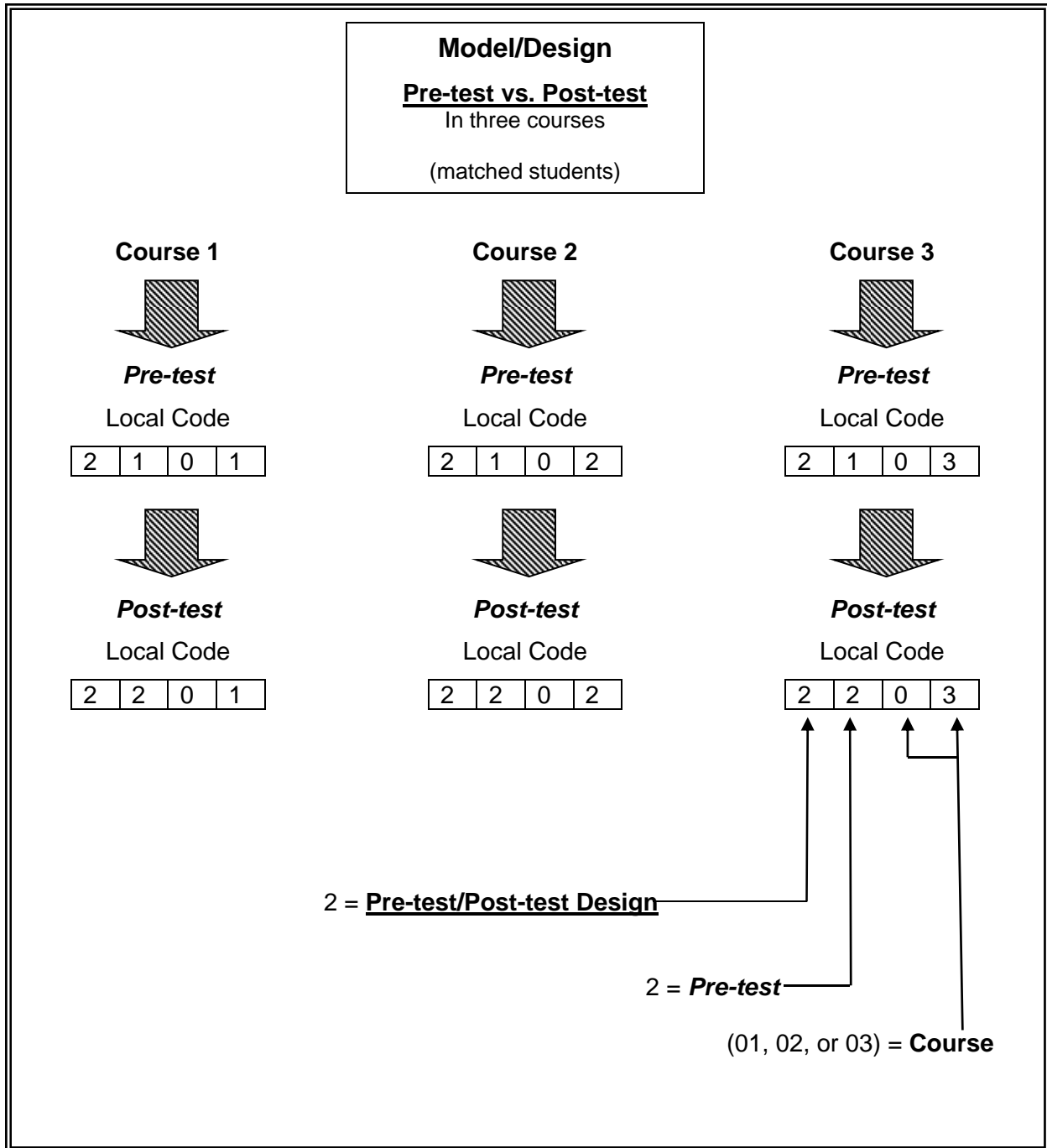Column 2: Use to indicate the student's specific **Treatment Condition** in the design.
Column 3: Use to indicate the particular class that was being tested **if a breakdown by class is desired**.

Column 1	Column 2	Column 3 & 4
0 (or blank) = No Breakdown	0 (or blank) = No Breakdown	
1 = Breakdown only by course	1 = Breakdown only by course	
2 = **Pretest/Post-test Design Matched Students** (identical ID #'s are used)	1 = Pretest 2 = Posttest	
3 = **Pretest/Post-test Design Not Matched Students**	1 = Pretest 2 = Posttest	0 (or blank) = No Breakdown 1 – 99 = code for each course or section tested if scores are to be compared by class
4 = Treatment vs. Control (single post-test used)	0 = Control 1 = Treatment	
5 = Lower Division vs. Upper Division Students	1 = Lower Division 2 = Upper Division	
6 = **Pretest/Post-test Design with Control Group Matched Students** (identical ID #'s are used)	0 = Control Pretest 1 = Control Post-test 2 = Treatment Pretest 3 = Treatment Post-test	
7 = **Pretest/Post-test Design with Control Group Not Matched Students**	0 = Control Pretest 1 = Control Post-test 2 = Treatment Pretest 3 = Treatment Post-test	

We can easily generate reports with breakdowns of data, if you use the coding scheme above. We encourage you to contact us and discuss your plans for developing your local code before administering the test.

Example of How to Code Tests with Local Codes

Model/Design

Pre-test vs. Post-test
In three courses

(matched students)

Course 1	Course 2	Course 3
Pre-test	*Pre-test*	*Pre-test*
Local Code	Local Code	Local Code
2 1 0 1	2 1 0 2	2 1 0 3
Post-test	*Post-test*	*Post-test*
Local Code	Local Code	Local Code
2 2 0 1	2 2 0 2	2 2 0 3

2 = **Pre-test/Post-test Design**

2 = *Pre-test*

(01, 02, or 03) = **Course**

Correlations with Entering ACT and SAT Scores

Student scores on the CAT instrument correlate with their scores on college entrance exams like the ACT and SAT. These entrance scores can explain about 25% of the variability in student performance on the CAT instrument.

	ACT	SAT
CAT	0.501*	0.516*

* correlations significant, $p < .01$ (updated on 8/10/10)

We provide the following table to show how the average entering ACT/SAT score at an institution might impact upper division student performance on the CAT instrument at 4 year institutions.

CAT National User Norms
(Upper division undergraduate, 4 year institutions)

Average College Entrance Score*		Upper division
ACT (Composite)	SAT (Verbal & Quantitative)	CAT Score (Estimated)
13	620	10.79
14	680	11.93
15	740	13.07
16	780	13.83
17	830	14.78
18	870	15.54
19	910	16.30
20	950	17.06
21	990	17.82
22	1030	18.58
23	1070	19.34
24	1110	20.10
25	1140	20.67
26	1180	21.43
27	1220	22.19
28	1260	22.95
29	1300	23.71
30	1340	24.47
31	1380	25.23
32	1420	25.99
33	1470	26.94
34	1520	27.89

*Updated 8/10/10

Your Institutional Report and Data Disk

CAT institutional reports provide information about your students' scores on the CAT instrument with descriptive information about sample demographics, mean score, minimum and maximum score, and standard deviation. In addition, the report provides a detailed frequencies breakdown of the distribution of answers (point values) for each question together with a general description of what the question is measuring. The mean score for each question and the percent of total points attained is also included. Current information about national norms is also provided. Additional comparisons are included as specified by the use of local codes.

A data file in Excel format is provided on a CD. This file contains the following information:

- Individual student responses for all questions on the demographics page and final scores for each test question

- The file includes two spreadsheets, one sheet includes all student data, the other sheet includes only students that did not have excessive missing data. The report is based on student data that is complete.

- The file also includes additional sheets with breakdowns of CAT scores that are included in the printed report.

The CD also contains a copy of the general report and CAT material order forms. Contact Kevin Harris for more information (kharris@tntech.edu, 931-372-3886).

| Variable Name	Type	Description
std_s1	Scale	Entrance Exam Score as entered by the institution
qpa	Scale	QPA as entered by the institution
testnum	Nominal	Test Booklet Number
stude1	Nominal	Student ID Number
loc-code	Nominal	Local Code as entered by institution
age	Nominal	Age
gender	Nominal	Gender (0=Male; 1=Female)
spanish	Nominal	Spanish/Hispanic/Latino (0=No; 1=Yes)
primary	Nominal	English is primary language (0=No; 1=Yes)
profi1	Nominal	Proficiency with English Language (1=Excellent; 2=Very Good; 3=Good; 4=Fair; 5=Poor)
standing	Nominal	Class Standing (1=Freshman; 2=Sophomore; 3= Junior; 4=Senior)
class	Nominal	University Standing (Undergraduate=1; Graduate=2)
white	Nominal	Race: White (0=No; 1=Yes)
black	Nominal	Race: Black or African American (0=No; 1=Yes)
amer1	Nominal	Race: American Indian or Alaska Native (0=No; 1=Yes)
asian	Nominal	Race: Asian (0=No; 1=Yes)
nativ1	Nominal	Race: Native Hawaiian or Other Pacific Islander (0=No; 1=Yes)
other1	Nominal	Race: Other (0=No; 1=Yes)
q1f – q15f	Scale	Computed Score for each question.
total	Scale	CAT total score
q1 – q15	Scale	Computed Score for each question. (Rounded)
report	Nominal	Case included in report (Y=Yes; N=No)

Colorado State University - Pueblo

CAT Institutional Report

December 2013 - All Students

CAT Overview: Descriptive Statistics for CAT Total Score
Colorado State University - Pueblo: December 2013 - All Students

	N	Min.	Max.	Mean	Std. Dev
CAT Total Score	200	7.00	31.00	18.50	5.58

Average Total Points Attained
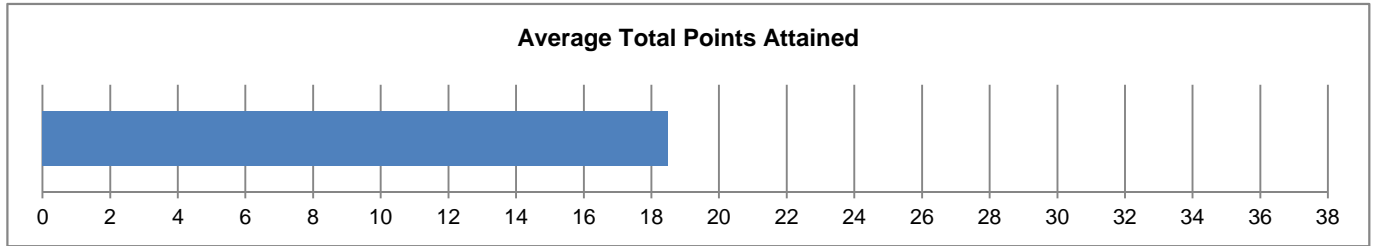
CAT Demographics: Descriptive Statistics for Sample

		Freq.	Freq. %
Gender	**Male**	72	36.0%
	Female	128	64.0%
Class Standing	**Freshman**	0	0.0%
	Sophomore	3	1.5%
	Junior	2	1.0%
	Senior	195	97.5%
Class	**Undergraduate**	200	100.0%
	Graduate	0	0.0%
Age	**≤ 20 years**	9	4.7%
	21-25 years	129	66.8%
	≥ 26 years	55	28.5%

		Freq.	Freq. %
Race**	**White**	152	76.0%
	Black or African American	11	5.5%
	American Indian or Alaska Native	8	4.0%
	Asian	7	3.5%
	Native Hawaiian or Other Pacific Islander	3	1.5%
	Other Race	33	16.5%

**The cumulative percent may exceed 100% as students are allowed to select more than one category.

		Freq.	Freq. %
Proficiency with the English Language*	**Excellent**	134	67.0%
	Very Good	50	25.0%
	Good	14	7.0%
	Fair	1	0.5%
	Poor	1	0.5%

* Self-rated

	Freq.	Freq. %
Spanish/Hispanic/Latino Ethnicity	59	29.5%
Considered English primary language?	193	96.5%

CAT Breakdown: Frequency of Points Awarded for Each Question

Colorado State University - Pueblo: December 2013 - All Students

	Skill Assessed by CAT Question	Points Awarded	Freq.	Freq. %
Q1	Summarize the pattern of results in a graph without making inappropriate inferences.	0	67	33.5%
		1	133	66.5%
Q2	Evaluate how strongly correlational-type data supports a hypothesis.	0	70	35.5%
		1	67	34.0%
		2	26	13.2%
		3	34	17.3%
Q3	Provide alternative explanations for a pattern of results that has many possible causes.	0	27	13.5%
		1	40	20.0%
		2	73	36.5%
		3	60	30.0%
Q4	Identify additional information needed to evaluate a hypothesis.	0	59	29.6%
		1	41	20.6%
		2	59	29.6%
		3	27	13.6%
		4	13	6.5%
Q5	Evaluate whether spurious information strongly supports a hypothesis.	0	59	29.6%
		1	140	70.4%
Q6	Provide alternative explanations for spurious associations.	0	18	9.0%
		1	86	43.0%
		2	80	40.0%
		3	16	8.0%
Q7	Identify additional information needed to evaluate a hypothesis.	0	81	40.5%
		1	101	50.5%
		2	18	9.0%
Q8	Determine whether an invited inference is supported by specific information.	0	86	43.0%
		1	114	57.0%
Q9	Provide relevant alternative interpretations for a specific set of results.	0	92	46.0%
		1	90	45.0%
		2	18	9.0%
Q10	Separate relevant from irrelevant information when solving a real-world problem.	0	2	1.0%
		1	5	2.5%
		2	26	13.1%
		3	87	43.7%
		4	79	39.7%
Q11	Use and apply relevant information to evaluate a problem.	0	48	24.0%
		1	114	57.0%
		2	38	19.0%
Q12	Use basic mathematical skills to help solve a real-world problem.	0	25	12.5%
		1	175	87.5%
Q13	Identify suitable solutions for a real-world problem using relevant information.	0	52	26.1%
		1	85	42.7%
		2	36	18.1%
		3	26	13.1%
Q14	Identify and explain the best solution for a real-world problem using relevant information.	0	67	34.0%
		1	40	20.3%
		2	6	3.0%
		3	24	12.2%
		4	35	17.8%
		5	25	12.7%
Q15	Explain how changes in a real-world problem situation might affect the solution.	0	49	24.5%
		1	67	33.5%
		2	64	32.0%
		3	20	10.0%

Institutional/Departmental Profile

Colorado State University - Pueblo: December 2013 - All Students

Evaluate and Interpret Info	Problem Solving	Creative Thinking	Effective Comm.		Skill Assessed by CAT Question	Institution/Department	
						Mean	Avg. % of Attainable Points
X				Q1	Summarize the pattern of results in a graph without making inappropriate inferences.	0.67	67%
X			X	Q2	Evaluate how strongly correlational-type data supports a hypothesis.	1.12	37%
		X	X	Q3	Provide alternative explanations for a pattern of results that has many possible causes.	1.83	61%
	X	X	X	Q4	Identify additional information needed to evaluate a hypothesis.	1.47	37%
X				Q5	Evaluate whether spurious information strongly supports a hypothesis.	0.70	70%
		X	X	Q6	Provide alternative explanations for spurious associations.	1.47	49%
	X	X	X	Q7	Identify additional information needed to evaluate a hypothesis.	0.69	34%
X				Q8	Determine whether an invited inference is supported by specific information.	0.57	57%
		X	X	Q9	Provide relevant alternative interpretations for a specific set of results.	0.63	32%
X	X			Q10	Separate relevant from irrelevant information when solving a real-world problem.	3.19	80%
X	X		X	Q11	Use and apply relevant information to evaluate a problem.	0.95	48%
	X			Q12	Use basic mathematical skills to help solve a real-world problem.	0.88	88%
X	X			Q13	Identify suitable solutions for a real-world problem using relevant information.	1.18	39%
X	X		X	Q14	Identify and explain the best solution for a real-world problem using relevant information.	1.97	39%
	X	X	X	Q15	Explain how changes in a real-world problem situation might affect the solution.	1.28	43%
					CAT Total Score	18.50	49%

The map of skills covered by each question above is a suggested theoretical guide for interpreting results.

Upper Division CAT Means Comparison Report

Colorado State University - Pueblo: December 2013 - All Students

Evaluate and Interpret Info	Problem Solving	Creative Thinking	Effective Comm.		Skill Assessed by CAT Question	Institution Mean	National Mean	National Probability of difference[a]	National Effect Size[b]
X				Q1	Summarize the pattern of results in a graph without making inappropriate inferences.	0.67	0.67		
X			X	Q2	Evaluate how strongly correlational-type data supports a hypothesis.	1.12	1.21		
		X	X	Q3	Provide alternative explanations for a pattern of results that has many possible causes.	1.83	1.35	***	+.47
	X	X	X	Q4	Identify additional information needed to evaluate a hypothesis.	1.47	1.41		
X				Q5	Evaluate whether spurious information strongly supports a hypothesis.	0.70	0.73		
		X	X	Q6	Provide alternative explanations for spurious associations.	1.47	1.56		
	X	X	X	Q7	Identify additional information needed to evaluate a hypothesis.	0.69	0.82	**	-.21
X				Q8	Determine whether an invited inference is supported by specific information.	0.57	0.68	***	-.24
		X	X	Q9	Provide relevant alternative interpretations for a specific set of results.	0.63	0.93	***	-.43
X	X			Q10	Separate relevant from irrelevant information when solving a real-world problem.	3.19	3.14		
X	X		X	Q11	Use and apply relevant information to evaluate a problem.	0.95	1.11	***	-.25
	X			Q12	Use basic mathematical skills to help solve a real-world problem.	0.88	0.82		
X	X			Q13	Identify suitable solutions for a real-world problem using relevant information.	1.18	1.18		
X	X		X	Q14	Identify and explain the best solution for a real-world problem using relevant information.	1.97	2.29	*	-.17
	X	X	X	Q15	Explain how changes in a real-world problem situation might affect the solution.	1.28	1.15		
					CAT Total Score	18.50	19.04		

[a]. * p<.05 **p<.01 ***p<.001 (2 –tailed)   Does not Account for entering ACT/SAT.

[b]. Mean difference divided by pooled group standard deviation.

 (0.1 - 0.3 = small effect; 0.3 - 0.5 = moderate effect; >0.5 = large effect)

The map of skills covered by each question above is a suggested theoretical guide for interpreting results.
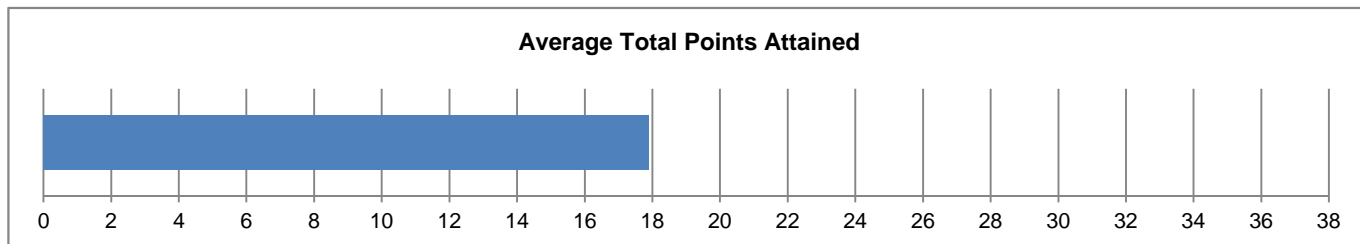
Colorado State University - Pueblo

CAT Institutional Report

December 2013 - College of Ed, Engr, & Prof. Studies

CAT Overview: Descriptive Statistics for CAT Total Score
Colorado State University - Pueblo: December 2013 - College of Ed, Engr, & Prof. Studies

	N	Min.	Max.	Mean	Std. Dev
CAT Total Score	60	7.00	29.00	17.90	5.13

Average Total Points Attained

CAT Demographics: Descriptive Statistics for Sample

		Freq.	Freq. %
Gender	Male	11	18.3%
	Female	49	81.7%
Class Standing	Freshman	0	0.0%
	Sophomore	0	0.0%
	Junior	0	0.0%
	Senior	60	100.0%
Class	Undergraduate	60	100.0%
	Graduate	0	0.0%
Age	≤ 20 years	0	0.0%
	21-25 years	36	62.1%
	≥ 26 years	22	37.9%

		Freq.	Freq. %
Race**	White	47	78.3%
	Black or African American	1	1.7%
	American Indian or Alaska Native	3	5.0%
	Asian	1	1.7%
	Native Hawaiian or Other Pacific Islander	0	0.0%
	Other Race	8	13.3%

**The cumulative percent may exceed 100% as students are allowed to select more than one category.

		Freq.	Freq. %
Proficiency with the English Language*	Excellent	44	73.3%
	Very Good	11	18.3%
	Good	5	8.3%
	Fair	0	0.0%
	Poor	0	0.0%

* Self-rated

	Freq.	Freq. %
Spanish/Hispanic/Latino Ethnicity	16	26.7%
Considered English primary language?	60	100.0%

CAT Breakdown: Frequency of Points Awarded for Each Question

Colorado State University - Pueblo: December 2013 - College of Ed, Engr, & Prof. Studies

	Skill Assessed by CAT Question	Points Awarded	Freq.	Freq. %
Q1	Summarize the pattern of results in a graph without making inappropriate inferences.	0	20	33.3%
		1	40	66.7%
Q2	Evaluate how strongly correlational-type data supports a hypothesis.	0	24	40.7%
		1	20	33.9%
		2	8	13.6%
		3	7	11.9%
Q3	Provide alternative explanations for a pattern of results that has many possible causes.	0	9	15.0%
		1	16	26.7%
		2	22	36.7%
		3	13	21.7%
Q4	Identify additional information needed to evaluate a hypothesis.	0	19	31.7%
		1	12	20.0%
		2	18	30.0%
		3	8	13.3%
		4	3	5.0%
Q5	Evaluate whether spurious information strongly supports a hypothesis.	0	17	28.8%
		1	42	71.2%
Q6	Provide alternative explanations for spurious associations.	0	5	8.3%
		1	24	40.0%
		2	26	43.3%
		3	5	8.3%
Q7	Identify additional information needed to evaluate a hypothesis.	0	31	51.7%
		1	25	41.7%
		2	4	6.7%
Q8	Determine whether an invited inference is supported by specific information.	0	30	50.0%
		1	30	50.0%
Q9	Provide relevant alternative interpretations for a specific set of results.	0	29	48.3%
		1	25	41.7%
		2	6	10.0%
Q10	Separate relevant from irrelevant information when solving a real-world problem.	0	0	0.0%
		1	2	3.3%
		2	10	16.7%
		3	28	46.7%
		4	20	33.3%
Q11	Use and apply relevant information to evaluate a problem.	0	12	20.0%
		1	30	50.0%
		2	18	30.0%
Q12	Use basic mathematical skills to help solve a real-world problem.	0	9	15.0%
		1	51	85.0%
Q13	Identify suitable solutions for a real-world problem using relevant information.	0	16	26.7%
		1	29	48.3%
		2	8	13.3%
		3	7	11.7%
Q14	Identify and explain the best solution for a real-world problem using relevant information.	0	20	33.9%
		1	10	16.9%
		2	2	3.4%
		3	9	15.3%
		4	10	16.9%
		5	8	13.6%
Q15	Explain how changes in a real-world problem situation might affect the solution.	0	17	28.3%
		1	19	31.7%
		2	20	33.3%
		3	4	6.7%

Institutional/Departmental Profile

Colorado State University - Pueblo: December 2013 - College of Ed, Engr, & Prof. Studies

Evaluate and Interpret Info	Problem Solving	Creative Thinking	Effective Comm.		Skill Assessed by CAT Question	Institution/Department	
						Mean	Avg. % of Attainable Points
X				Q1	Summarize the pattern of results in a graph without making inappropriate inferences.	0.67	67%
X			X	Q2	Evaluate how strongly correlational-type data supports a hypothesis.	0.97	32%
		X	X	Q3	Provide alternative explanations for a pattern of results that has many possible causes.	1.66	55%
	X	X	X	Q4	Identify additional information needed to evaluate a hypothesis.	1.40	35%
X				Q5	Evaluate whether spurious information strongly supports a hypothesis.	0.71	71%
		X	X	Q6	Provide alternative explanations for spurious associations.	1.51	50%
	X	X	X	Q7	Identify additional information needed to evaluate a hypothesis.	0.55	28%
X				Q8	Determine whether an invited inference is supported by specific information.	0.50	50%
		X	X	Q9	Provide relevant alternative interpretations for a specific set of results.	0.62	31%
X	X			Q10	Separate relevant from irrelevant information when solving a real-world problem.	3.10	78%
X	X		X	Q11	Use and apply relevant information to evaluate a problem.	1.10	55%
	X			Q12	Use basic mathematical skills to help solve a real-world problem.	0.85	85%
X	X			Q13	Identify suitable solutions for a real-world problem using relevant information.	1.10	37%
X	X		X	Q14	Identify and explain the best solution for a real-world problem using relevant information.	2.05	41%
	X	X	X	Q15	Explain how changes in a real-world problem situation might affect the solution.	1.18	39%
					CAT Total Score	17.90	47%

The map of skills covered by each question above is a suggested theoretical guide for interpreting results.

Upper Division CAT Means Comparison Report

Colorado State University - Pueblo: December 2013 - College of Ed, Engr, & Prof. Studies

Evaluate and Interpret Info	Problem Solving	Creative Thinking	Effective Comm.		Skill Assessed by CAT Question	Institution	National		
						Mean	Mean	Probability of difference[a]	Effect Size[b]
X				Q1	Summarize the pattern of results in a graph without making inappropriate inferences.	0.67	0.67		
X			X	Q2	Evaluate how strongly correlational-type data supports a hypothesis.	0.97	1.21		
		X	X	Q3	Provide alternative explanations for a pattern of results that has many possible causes.	1.66	1.35	*	+.30
	X	X	X	Q4	Identify additional information needed to evaluate a hypothesis.	1.40	1.41		
X				Q5	Evaluate whether spurious information strongly supports a hypothesis.	0.71	0.73		
		X	X	Q6	Provide alternative explanations for spurious associations.	1.51	1.56		
	X	X	X	Q7	Identify additional information needed to evaluate a hypothesis.	0.55	0.82	**	-.41
X				Q8	Determine whether an invited inference is supported by specific information.	0.50	0.68	**	-.39
		X	X	Q9	Provide relevant alternative interpretations for a specific set of results.	0.62	0.93	**	-.44
X	X			Q10	Separate relevant from irrelevant information when solving a real-world problem.	3.10	3.14		
X	X		X	Q11	Use and apply relevant information to evaluate a problem.	1.10	1.11		
	X			Q12	Use basic mathematical skills to help solve a real-world problem.	0.85	0.82		
X	X			Q13	Identify suitable solutions for a real-world problem using relevant information.	1.10	1.18		
X	X		X	Q14	Identify and explain the best solution for a real-world problem using relevant information.	2.05	2.29		
	X	X	X	Q15	Explain how changes in a real-world problem situation might affect the solution.	1.18	1.15		
					CAT Total Score	17.90	19.04		

[a]. * p<.05 **p<.01 ***p<.001 (2 –tailed)   Does not Account for entering ACT/SAT.

[b]. Mean difference divided by pooled group standard deviation.

 (0.1 - 0.3 = small effect; 0.3 - 0.5 = moderate effect; >0.5 = large effect)

The map of skills covered by each question above is a suggested theoretical guide for interpreting results.
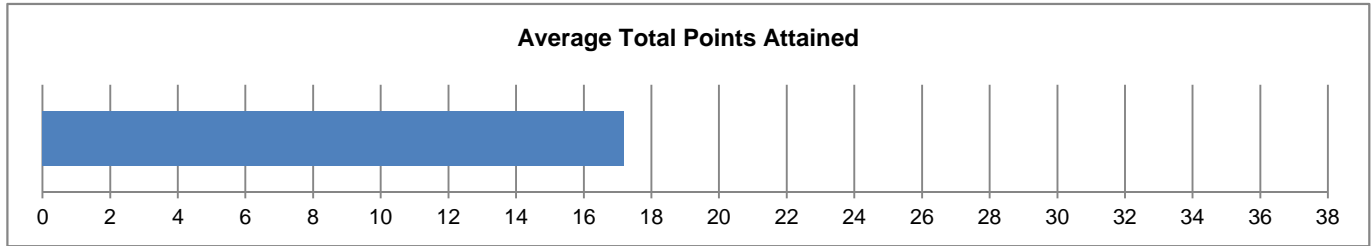
Colorado State University - Pueblo

CAT Institutional Report

December 2013 - College of Humanities & Soc. Sci.

CAT Overview: Descriptive Statistics for CAT Total Score
Colorado State University - Pueblo: December 2013 - College of Humanities & Soc. Sci.

	N	Min.	Max.	Mean	Std. Dev
CAT Total Score	76	8.00	29.00	17.18	5.68

Average Total Points Attained

CAT Demographics: Descriptive Statistics for Sample

		Freq.	Freq. %
Gender	**Male**	33	43.4%
	Female	43	56.6%
Class Standing	**Freshman**	0	0.0%
	Sophomore	3	3.9%
	Junior	2	2.6%
	Senior	71	93.4%
Class	**Undergraduate**	76	100.0%
	Graduate	0	0.0%
Age	**≤ 20 years**	5	6.8%
	21-25 years	45	61.6%
	≥ 26 years	23	31.5%

		Freq.	Freq. %
Race**	**White**	49	64.5%
	Black or African American	8	10.5%
	American Indian or Alaska Native	3	3.9%
	Asian	3	3.9%
	Native Hawaiian or Other Pacific Islander	3	3.9%
	Other Race	19	25.0%

**The cumulative percent may exceed 100% as students are allowed to select more than one category.

		Freq.	Freq. %
Proficiency with the English Language*	**Excellent**	50	65.8%
	Very Good	19	25.0%
	Good	7	9.2%
	Fair	0	0.0%
	Poor	0	0.0%

* Self-rated

	Freq.	Freq. %
Spanish/Hispanic/Latino Ethnicity	32	42.1%
Considered English primary language?	70	92.1%

CAT Breakdown: Frequency of Points Awarded for Each Question
Colorado State University - Pueblo: December 2013 - College of Humanities & Soc. Sci.

	Skill Assessed by CAT Question	Points Awarded	Freq.	Freq. %
Q1	Summarize the pattern of results in a graph without making inappropriate inferences.	0	33	43.4%
		1	43	56.6%
Q2	Evaluate how strongly correlational-type data supports a hypothesis.	0	28	37.3%
		1	29	38.7%
		2	7	9.3%
		3	11	14.7%
Q3	Provide alternative explanations for a pattern of results that has many possible causes.	0	18	23.7%
		1	18	23.7%
		2	21	27.6%
		3	19	25.0%
Q4	Identify additional information needed to evaluate a hypothesis.	0	27	36.0%
		1	21	28.0%
		2	17	22.7%
		3	6	8.0%
		4	4	5.3%
Q5	Evaluate whether spurious information strongly supports a hypothesis.	0	23	30.3%
		1	53	69.7%
Q6	Provide alternative explanations for spurious associations.	0	11	14.5%
		1	30	39.5%
		2	30	39.5%
		3	5	6.6%
Q7	Identify additional information needed to evaluate a hypothesis.	0	29	38.2%
		1	43	56.6%
		2	4	5.3%
Q8	Determine whether an invited inference is supported by specific information.	0	33	43.4%
		1	43	56.6%
Q9	Provide relevant alternative interpretations for a specific set of results.	0	42	55.3%
		1	28	36.8%
		2	6	7.9%
Q10	Separate relevant from irrelevant information when solving a real-world problem.	0	2	2.6%
		1	1	1.3%
		2	6	7.9%
		3	30	39.5%
		4	37	48.7%
Q11	Use and apply relevant information to evaluate a problem.	0	19	25.0%
		1	49	64.5%
		2	8	10.5%
Q12	Use basic mathematical skills to help solve a real-world problem.	0	11	14.5%
		1	65	85.5%
Q13	Identify suitable solutions for a real-world problem using relevant information.	0	18	23.7%
		1	39	51.3%
		2	12	15.8%
		3	7	9.2%
Q14	Identify and explain the best solution for a real-world problem using relevant information.	0	28	36.8%
		1	17	22.4%
		2	3	3.9%
		3	6	7.9%
		4	15	19.7%
		5	7	9.2%
Q15	Explain how changes in a real-world problem situation might affect the solution.	0	23	30.3%
		1	25	32.9%
		2	21	27.6%
		3	7	9.2%

Institutional/Departmental Profile

Colorado State University - Pueblo: December 2013 - College of Humanities & Soc. Sci.

Evaluate and Interpret Info	Problem Solving	Creative Thinking	Effective Comm.		Skill Assessed by CAT Question	Institution/Department Mean	Avg. % of Attainable Points
X				Q1	Summarize the pattern of results in a graph without making inappropriate inferences.	0.57	57%
X			X	Q2	Evaluate how strongly correlational-type data supports a hypothesis.	1.01	34%
		X	X	Q3	Provide alternative explanations for a pattern of results that has many possible causes.	1.54	51%
	X	X	X	Q4	Identify additional information needed to evaluate a hypothesis.	1.19	30%
X				Q5	Evaluate whether spurious information strongly supports a hypothesis.	0.70	70%
		X	X	Q6	Provide alternative explanations for spurious associations.	1.39	46%
	X	X	X	Q7	Identify additional information needed to evaluate a hypothesis.	0.67	34%
X				Q8	Determine whether an invited inference is supported by specific information.	0.57	57%
		X	X	Q9	Provide relevant alternative interpretations for a specific set of results.	0.53	26%
X	X			Q10	Separate relevant from irrelevant information when solving a real-world problem.	3.30	83%
X	X		X	Q11	Use and apply relevant information to evaluate a problem.	0.86	43%
	X			Q12	Use basic mathematical skills to help solve a real-world problem.	0.86	86%
X	X			Q13	Identify suitable solutions for a real-world problem using relevant information.	1.11	37%
X	X		X	Q14	Identify and explain the best solution for a real-world problem using relevant information.	1.79	36%
	X	X	X	Q15	Explain how changes in a real-world problem situation might affect the solution.	1.16	39%
					CAT Total Score	17.18	45%

The map of skills covered by each question above is a suggested theoretical guide for interpreting results.

Upper Division CAT Means Comparison Report

Colorado State University - Pueblo: December 2013 - College of Humanities & Soc. Sci.

Evaluate and Interpret Info	Problem Solving	Creative Thinking	Effective Comm.		Skill Assessed by CAT Question	Institution Mean	National Mean	National Probability of difference[a]	National Effect Size[b]
X				Q1	Summarize the pattern of results in a graph without making inappropriate inferences.	0.57	0.67		
X			X	Q2	Evaluate how strongly correlational-type data supports a hypothesis.	1.01	1.21		
		X	X	Q3	Provide alternative explanations for a pattern of results that has many possible causes.	1.54	1.35		
	X	X	X	Q4	Identify additional information needed to evaluate a hypothesis.	1.19	1.41		
X				Q5	Evaluate whether spurious information strongly supports a hypothesis.	0.70	0.73		
		X	X	Q6	Provide alternative explanations for spurious associations.	1.39	1.56		
	X	X	X	Q7	Identify additional information needed to evaluate a hypothesis.	0.67	0.82		
X				Q8	Determine whether an invited inference is supported by specific information.	0.57	0.68	*	-.25
		X	X	Q9	Provide relevant alternative interpretations for a specific set of results.	0.53	0.93	***	-.58
X	X			Q10	Separate relevant from irrelevant information when solving a real-world problem.	3.30	3.14		
X	X		X	Q11	Use and apply relevant information to evaluate a problem.	0.86	1.11	***	-.42
	X			Q12	Use basic mathematical skills to help solve a real-world problem.	0.86	0.82		
X	X			Q13	Identify suitable solutions for a real-world problem using relevant information.	1.11	1.18		
X	X		X	Q14	Identify and explain the best solution for a real-world problem using relevant information.	1.79	2.29	*	-.27
	X	X	X	Q15	Explain how changes in a real-world problem situation might affect the solution.	1.16	1.15		
					CAT Total Score	17.18	19.04	**	-.32

[a]. * p<.05 **p<.01 ***p<.001 (2 –tailed)   Does not Account for entering ACT/SAT.

[b]. Mean difference divided by pooled group standard deviation.

 (0.1 - 0.3 = small effect; 0.3 - 0.5 = moderate effect; >0.5 = large effect)

The map of skills covered by each question above is a suggested theoretical guide for interpreting results.
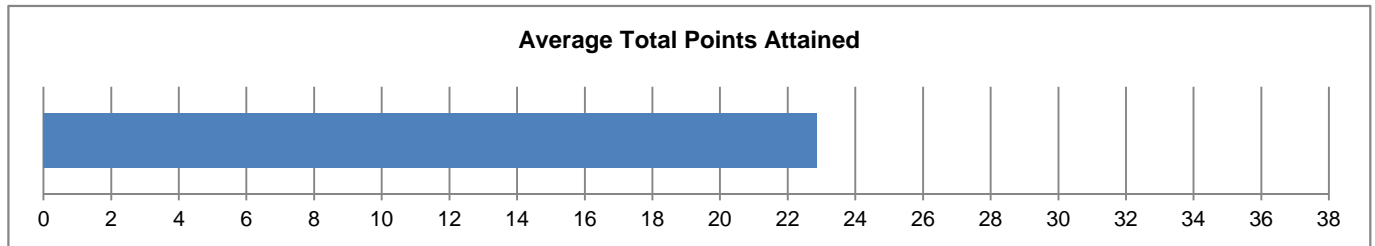
Colorado State University - Pueblo

CAT Institutional Report

December 2013 - College of Science and Mathematics

CAT Overview: Descriptive Statistics for CAT Total Score
Colorado State University - Pueblo: December 2013 - College of Science and Mathematics

	N	Min.	Max.	Mean	Std. Dev
CAT Total Score	32	14.00	31.00	22.85	5.03

Average Total Points Attained

CAT Demographics: Descriptive Statistics for Sample

		Freq.	Freq. %
Gender	**Male**	14	43.8%
	Female	18	56.3%
Class Standing	**Freshman**	0	0.0%
	Sophomore	0	0.0%
	Junior	0	0.0%
	Senior	32	100.0%
Class	**Undergraduate**	32	100.0%
	Graduate	0	0.0%
Age	**≤ 20 years**	3	10.0%
	21-25 years	21	70.0%
	≥ 26 years	6	20.0%

		Freq.	Freq. %
Race**	**White**	31	96.9%
	Black or African American	0	0.0%
	American Indian or Alaska Native	2	6.3%
	Asian	1	3.1%
	Native Hawaiian or Other Pacific Islander	0	0.0%
	Other Race	1	3.1%

**The cumulative percent may exceed 100% as students are allowed to select more than one category.

		Freq.	Freq. %
Proficiency with the English Language*	**Excellent**	22	68.8%
	Very Good	8	25.0%
	Good	1	3.1%
	Fair	0	0.0%
	Poor	1	3.1%

* Self-rated

	Freq.	Freq. %
Spanish/Hispanic/Latino Ethnicity	2	6.3%
Considered English primary language?	31	96.9%

CAT Breakdown: Frequency of Points Awarded for Each Question
Colorado State University - Pueblo: December 2013 - College of Science and Mathematics

	Skill Assessed by CAT Question	Points Awarded	Freq.	Freq. %
Q1	Summarize the pattern of results in a graph without making inappropriate inferences.	0	2	6.3%
		1	30	93.8%
Q2	Evaluate how strongly correlational-type data supports a hypothesis.	0	9	28.1%
		1	6	18.8%
		2	6	18.8%
		3	11	34.4%
Q3	Provide alternative explanations for a pattern of results that has many possible causes.	0	0	0.0%
		1	3	9.4%
		2	17	53.1%
		3	12	37.5%
Q4	Identify additional information needed to evaluate a hypothesis.	0	6	18.8%
		1	4	12.5%
		2	9	28.1%
		3	8	25.0%
		4	5	15.6%
Q5	Evaluate whether spurious information strongly supports a hypothesis.	0	7	21.9%
		1	25	78.1%
Q6	Provide alternative explanations for spurious associations.	0	0	0.0%
		1	14	43.8%
		2	15	46.9%
		3	3	9.4%
Q7	Identify additional information needed to evaluate a hypothesis.	0	10	31.3%
		1	16	50.0%
		2	6	18.8%
Q8	Determine whether an invited inference is supported by specific information.	0	7	21.9%
		1	25	78.1%
Q9	Provide relevant alternative interpretations for a specific set of results.	0	7	21.9%
		1	21	65.6%
		2	4	12.5%
Q10	Separate relevant from irrelevant information when solving a real-world problem.	0	0	0.0%
		1	2	6.3%
		2	5	15.6%
		3	13	40.6%
		4	12	37.5%
Q11	Use and apply relevant information to evaluate a problem.	0	6	18.8%
		1	16	50.0%
		2	10	31.3%
Q12	Use basic mathematical skills to help solve a real-world problem.	0	2	6.3%
		1	30	93.8%
Q13	Identify suitable solutions for a real-world problem using relevant information.	0	6	19.4%
		1	9	29.0%
		2	9	29.0%
		3	7	22.6%
Q14	Identify and explain the best solution for a real-world problem using relevant information.	0	6	20.0%
		1	4	13.3%
		2	0	0.0%
		3	6	20.0%
		4	7	23.3%
		5	7	23.3%
Q15	Explain how changes in a real-world problem situation might affect the solution.	0	3	9.4%
		1	10	31.3%
		2	13	40.6%
		3	6	18.8%

Institutional/Departmental Profile

Colorado State University - Pueblo: December 2013 - College of Science and Mathematics

Evaluate and Interpret Info	Problem Solving	Creative Thinking	Effective Comm.		Skill Assessed by CAT Question	Institution/Department Mean	Avg. % of Attainable Points
X				Q1	Summarize the pattern of results in a graph without making inappropriate inferences.	0.94	94%
X			X	Q2	Evaluate how strongly correlational-type data supports a hypothesis.	1.59	53%
		X	X	Q3	Provide alternative explanations for a pattern of results that has many possible causes.	2.27	76%
	X	X	X	Q4	Identify additional information needed to evaluate a hypothesis.	2.05	51%
X				Q5	Evaluate whether spurious information strongly supports a hypothesis.	0.78	78%
		X	X	Q6	Provide alternative explanations for spurious associations.	1.66	55%
	X	X	X	Q7	Identify additional information needed to evaluate a hypothesis.	0.88	44%
X				Q8	Determine whether an invited inference is supported by specific information.	0.78	78%
		X	X	Q9	Provide relevant alternative interpretations for a specific set of results.	0.91	45%
X	X			Q10	Separate relevant from irrelevant information when solving a real-world problem.	3.09	77%
X	X		X	Q11	Use and apply relevant information to evaluate a problem.	1.13	56%
	X			Q12	Use basic mathematical skills to help solve a real-world problem.	0.94	94%
X	X			Q13	Identify suitable solutions for a real-world problem using relevant information.	1.55	52%
X	X		X	Q14	Identify and explain the best solution for a real-world problem using relevant information.	2.83	57%
	X	X	X	Q15	Explain how changes in a real-world problem situation might affect the solution.	1.69	56%
					CAT Total Score	22.85	60%

The map of skills covered by each question above is a suggested theoretical guide for interpreting results.

Upper Division CAT Means Comparison Report

Colorado State University - Pueblo: December 2013 - College of Science and Mathematics

Evaluate and Interpret Info	Problem Solving	Creative Thinking	Effective Comm.		Skill Assessed by CAT Question	Institution Mean	National Mean	National Probability of difference[a]	National Effect Size[b]
X				Q1	Summarize the pattern of results in a graph without making inappropriate inferences.	0.94	0.67	**	+.73
X			X	Q2	Evaluate how strongly correlational-type data supports a hypothesis.	1.59	1.21		
		X	X	Q3	Provide alternative explanations for a pattern of results that has many possible causes.	2.27	1.35	***	+1.06
	X	X	X	Q4	Identify additional information needed to evaluate a hypothesis.	2.05	1.41	**	+.49
X				Q5	Evaluate whether spurious information strongly supports a hypothesis.	0.78	0.73		
		X	X	Q6	Provide alternative explanations for spurious associations.	1.66	1.56		
	X	X	X	Q7	Identify additional information needed to evaluate a hypothesis.	0.88	0.82		
X				Q8	Determine whether an invited inference is supported by specific information.	0.78	0.68		
		X	X	Q9	Provide relevant alternative interpretations for a specific set of results.	0.91	0.93		
X	X			Q10	Separate relevant from irrelevant information when solving a real-world problem.	3.09	3.14		
X	X		X	Q11	Use and apply relevant information to evaluate a problem.	1.13	1.11		
	X			Q12	Use basic mathematical skills to help solve a real-world problem.	0.94	0.82		
X	X			Q13	Identify suitable solutions for a real-world problem using relevant information.	1.55	1.18		
X	X		X	Q14	Identify and explain the best solution for a real-world problem using relevant information.	2.83	2.29		
	X	X	X	Q15	Explain how changes in a real-world problem situation might affect the solution.	1.69	1.15	**	+.55
					CAT Total Score	22.85	19.04	**	+.69

[a]. * p<.05 **p<.01 ***p<.001 (2 –tailed)   Does not Account for entering ACT/SAT.

[b]. Mean difference divided by pooled group standard deviation.

 (0.1 - 0.3 = small effect; 0.3 - 0.5 = moderate effect; >0.5 = large effect)

The map of skills covered by each question above is a suggested theoretical guide for interpreting results.
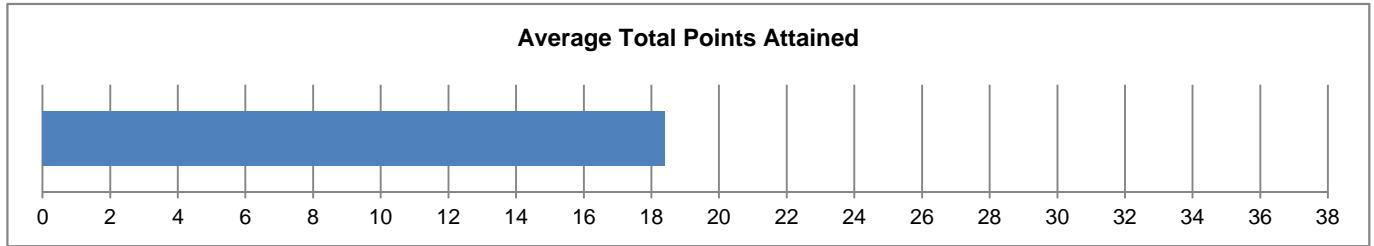
Colorado State University - Pueblo

CAT Institutional Report

December 2013 - Hasan School of Business

CAT Overview: Descriptive Statistics for CAT Total Score
Colorado State University - Pueblo: December 2013 - Hasan School of Business

	N	Min.	Max.	Mean	Std. Dev
CAT Total Score	32	10.00	28.00	18.41	4.70

Average Total Points Attained

CAT Demographics: Descriptive Statistics for Sample

		Freq.	Freq. %
Gender	**Male**	14	43.8%
	Female	18	56.3%
Class Standing	**Freshman**	0	0.0%
	Sophomore	0	0.0%
	Junior	0	0.0%
	Senior	32	100.0%
Class	**Undergraduate**	32	100.0%
	Graduate	0	0.0%
Age	**≤ 20 years**	1	3.1%
	21-25 years	27	84.4%
	≥ 26 years	4	12.5%

		Freq.	Freq. %
Race**	**White**	25	78.1%
	Black or African American	2	6.3%
	American Indian or Alaska Native	0	0.0%
	Asian	2	6.3%
	Native Hawaiian or Other Pacific Islander	0	0.0%
	Other Race	5	15.6%

**The cumulative percent may exceed 100% as students are allowed to select more than one category.

		Freq.	Freq. %
Proficiency with the English Language*	**Excellent**	18	56.3%
	Very Good	12	37.5%
	Good	1	3.1%
	Fair	1	3.1%
	Poor	0	0.0%

* Self-rated

	Freq.	Freq. %
Spanish/Hispanic/Latino Ethnicity	9	28.1%
Considered English primary language?	32	100.0%

CAT Breakdown: Frequency of Points Awarded for Each Question

Colorado State University - Pueblo: December 2013 - Hasan School of Business

	Skill Assessed by CAT Question	Points Awarded	Freq.	Freq. %
Q1	Summarize the pattern of results in a graph without making inappropriate inferences.	0	12	37.5%
		1	20	62.5%
Q2	Evaluate how strongly correlational-type data supports a hypothesis.	0	9	29.0%
		1	12	38.7%
		2	5	16.1%
		3	5	16.1%
Q3	Provide alternative explanations for a pattern of results that has many possible causes.	0	0	0.0%
		1	3	9.4%
		2	13	40.6%
		3	16	50.0%
Q4	Identify additional information needed to evaluate a hypothesis.	0	7	21.9%
		1	4	12.5%
		2	15	46.9%
		3	5	15.6%
		4	1	3.1%
Q5	Evaluate whether spurious information strongly supports a hypothesis.	0	12	37.5%
		1	20	62.5%
Q6	Provide alternative explanations for spurious associations.	0	2	6.3%
		1	18	56.3%
		2	9	28.1%
		3	3	9.4%
Q7	Identify additional information needed to evaluate a hypothesis.	0	11	34.4%
		1	17	53.1%
		2	4	12.5%
Q8	Determine whether an invited inference is supported by specific information.	0	16	50.0%
		1	16	50.0%
Q9	Provide relevant alternative interpretations for a specific set of results.	0	14	43.8%
		1	16	50.0%
		2	2	6.3%
Q10	Separate relevant from irrelevant information when solving a real-world problem.	0	0	0.0%
		1	0	0.0%
		2	5	16.1%
		3	16	51.6%
		4	10	32.3%
Q11	Use and apply relevant information to evaluate a problem.	0	11	34.4%
		1	19	59.4%
		2	2	6.3%
Q12	Use basic mathematical skills to help solve a real-world problem.	0	3	9.4%
		1	29	90.6%
Q13	Identify suitable solutions for a real-world problem using relevant information.	0	12	37.5%
		1	8	25.0%
		2	7	21.9%
		3	5	15.6%
Q14	Identify and explain the best solution for a real-world problem using relevant information.	0	13	40.6%
		1	9	28.1%
		2	1	3.1%
		3	3	9.4%
		4	3	9.4%
		5	3	9.4%
Q15	Explain how changes in a real-world problem situation might affect the solution.	0	6	18.8%
		1	13	40.6%
		2	10	31.3%
		3	3	9.4%

Institutional/Departmental Profile

Colorado State University - Pueblo: December 2013 - Hasan School of Business

Evaluate and Interpret Info	Problem Solving	Creative Thinking	Effective Comm.		Skill Assessed by CAT Question	Institution/Department	
						Mean	Avg. % of Attainable Points
X				Q1	Summarize the pattern of results in a graph without making inappropriate inferences.	0.63	63%
X			X	Q2	Evaluate how strongly correlational-type data supports a hypothesis.	1.18	39%
		X	X	Q3	Provide alternative explanations for a pattern of results that has many possible causes.	2.40	80%
	X	X	X	Q4	Identify additional information needed to evaluate a hypothesis.	1.68	42%
X				Q5	Evaluate whether spurious information strongly supports a hypothesis.	0.63	63%
		X	X	Q6	Provide alternative explanations for spurious associations.	1.41	47%
	X	X	X	Q7	Identify additional information needed to evaluate a hypothesis.	0.78	39%
X				Q8	Determine whether an invited inference is supported by specific information.	0.50	50%
		X	X	Q9	Provide relevant alternative interpretations for a specific set of results.	0.63	31%
X	X			Q10	Separate relevant from irrelevant information when solving a real-world problem.	3.16	79%
X	X		X	Q11	Use and apply relevant information to evaluate a problem.	0.72	36%
	X			Q12	Use basic mathematical skills to help solve a real-world problem.	0.91	91%
X	X			Q13	Identify suitable solutions for a real-world problem using relevant information.	1.16	39%
X	X		X	Q14	Identify and explain the best solution for a real-world problem using relevant information.	1.47	29%
	X	X	X	Q15	Explain how changes in a real-world problem situation might affect the solution.	1.31	44%
					CAT Total Score	18.41	48%

The map of skills covered by each question above is a suggested theoretical guide for interpreting results.

Upper Division CAT Means Comparison Report

Colorado State University - Pueblo: December 2013 - Hasan School of Business

Evaluate and Interpret Info	Problem Solving	Creative Thinking	Effective Comm.		Skill Assessed by CAT Question	Institution Mean	National Mean	National Probability of difference[a]	National Effect Size[b]
X				Q1	Summarize the pattern of results in a graph without making inappropriate inferences.	0.63	0.67		
X			X	Q2	Evaluate how strongly correlational-type data supports a hypothesis.	1.18	1.21		
		X	X	Q3	Provide alternative explanations for a pattern of results that has many possible causes.	2.40	1.35	***	+1.19
	X	X	X	Q4	Identify additional information needed to evaluate a hypothesis.	1.68	1.41		
X				Q5	Evaluate whether spurious information strongly supports a hypothesis.	0.63	0.73		
		X	X	Q6	Provide alternative explanations for spurious associations.	1.41	1.56		
	X	X	X	Q7	Identify additional information needed to evaluate a hypothesis.	0.78	0.82		
X				Q8	Determine whether an invited inference is supported by specific information.	0.50	0.68	*	-.39
		X	X	Q9	Provide relevant alternative interpretations for a specific set of results.	0.63	0.93	*	-.45
X	X			Q10	Separate relevant from irrelevant information when solving a real-world problem.	3.16	3.14		
X	X		X	Q11	Use and apply relevant information to evaluate a problem.	0.72	1.11	**	-.64
	X			Q12	Use basic mathematical skills to help solve a real-world problem.	0.91	0.82		
X	X			Q13	Identify suitable solutions for a real-world problem using relevant information.	1.16	1.18		
X	X		X	Q14	Identify and explain the best solution for a real-world problem using relevant information.	1.47	2.29	*	-.46
	X	X	X	Q15	Explain how changes in a real-world problem situation might affect the solution.	1.31	1.15		
					CAT Total Score	18.41	19.04		

[a]. * p<.05 **p<.01 ***p<.001 (2 –tailed)   Does not Account for entering ACT/SAT.

[b]. Mean difference divided by pooled group standard deviation.

 (0.1 - 0.3 = small effect; 0.3 - 0.5 = moderate effect; >0.5 = large effect)

The map of skills covered by each question above is a suggested theoretical guide for interpreting results.